

How Do You Solve a System of Equations by Substitution?

$$\begin{aligned}3x+2y&=10 \\ 2x-y&=9\end{aligned}$$

1st Choose one equation and solve for x or y.

Solve for y in the 2nd equation.

Subtract 2x from both sides

$$-y = -2x + 9$$

Divide both sides by -1

$$y = 2x - 9$$

2nd Substitute the expression from that equation into the other equation and solve.

Plug $2x-9$ in the 1st equation for y

$$3x + 2(2x - 9) = 10$$

Simplify

$$3x + 4x - 18 = 10$$

$$7x - 18 = 10$$

Solve

$$7x = 28$$

$$x = 4$$

3rd Substitute the value found in step 2 back into the equation solved step one.

Use the solved equation $y = 2x - 9$ and substitute $x = 4$

Simplify

$$y = 2(4) - 9$$

Continuing

$$y = 8 - 9 = -1$$

So the solution is $(4, -1)$

Solve by Substitution

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